Main Library

THE PLANT DISEASE REPORTER

LIBRARY
RECEIVED
★ OCT 14 1939 ★
U.S. Department of Agriculture

Issued By

Division of Mycology and Disease Survey

Volume XXIII Number 18

October 1, 1939

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXIII Number 18

October 1, 1939

IN THIS ISSUE

J. G. Leach reports that phloem necrosis of elm is very destructive in southwestern West Virginia, page 300. According to W. D. Valleau, the disease seems to be of long standing in the vicinity of Lexington, Kentucky.

Damage from ear rots in the 1938 corn crop was very low, according to information summarized by Neil E. Stevens, page 301.

James Johnson sends a report on the 1939 tobacco field survey in Wisconsin, page 306.

James G. Horsfall and A. D. McDonnell report observations on the effect of wind on blossom-end rot of tomatoes, page 307.

C. F. Andrus contributes a note on some vegetable diseases in South Carolina, page 308.

Brief notes, page 309, include reports of Sclerotium delphinii on trillium, by Cynthia Westcott, and of Cercbella on carpet grass in Louisiana and Mississippi, by D. C. Neal and by L. E. Miles, and a correction.

TWO REPORTS ON PHLOEM NECROSIS OF ELM

PHLOEM NECROSIS SERIOUS IN SOUTHWESTERN WEST VIRGINIA: During the past summer an opportunity was afforded for observing the phloem necrosis of elm in West Virginia. This disease is rapidly killing elm trees throughout the southwestern portion of West Virginia. It has been known to be present for several years in the vicinity of Huntington, where it has killed several thousand elm trees. The disease appears to be spreading rapidly and the number of trees killed in a given locality increases each year. The disease has been found as far east as Cedar Grove, about 20 miles east of Charleston and as far north as Parkersburg. It is especially destructive in Huntington, St. Albans, and Parkersburg. The destructive nature of the disease can not be overemphasized. Trees of all ages are susceptible and a tree of the largest size may be killed within a single season. It would appear that this disease is potentially as dangerous as or more dangerous than the Dutch elm disease.

The serious possibilities of the disease can be appreciated more when we realize that no effective means of combating it is known. It is evidently caused by a virus and is probably transmitted by an insect, although there is no experimental evidence to support the latter assumption. If it is transmitted by a sucking insect, cutting and removing dead trees would probably be of little value in the control of the disease or the insect vector. The situation is further complicated by the presence throughout the western half of West Virginia of Scolytus multistriatus, the vector of the Dutch elm disease. Since this insect breeds in dead or dying trees, the trees killed by the virus disease afford excellent breeding places. My observations during the past summer showed that the beetles were present throughout the area in which the virus disease was found, breeding abundantly in all of the virus-infected trees observed. It is safe to predict that this insect is going to become very abundant throughout this general region in the next few years. A still further complication is the known presence of the Dutch elm disease in Athens County, Ohio, within 20 miles of Parkersburg, where the beetles are multiplying rapidly in trees killed by phloem necrosis. It is not difficult to imagine what will happen when the virus disease, the Dutch elm disease fungus, and the bark beetle all come together in one locality. Unless the Dutch elm disease occurring in this region can be thoroughly and effectively eradicated before this happens, the outlook for elms in this general region is not very bright.

(J. G. Leach, West Virginia University. September 21).

PHLOEM NECROSIS IN KENTUCKY: On September 19, Dr. Roger U. Swingle, Mr. Louis Hillenmeyer, Jr., and the writer visited several estates in the vicinity of Lexington for the purpose of examining elms which were dying. A few cases of fungous wilts were found on slow growing trees but the

greater part of the trouble was diagnosed by Doctor Swingle as phloem necrosis caused by a virus. The disease in this vicinity has been present to Mr. Hillenmeyer, Sr.'s knowledge for over 10 years and possibly longer. It has caused death of about 50 percent of the elms on one estate and trees are still dying, and it has caused the death of numerous elms on other estates. Only transplanted trees from about 5 to 15 years from the time of transplanting seem to be affected. All of the trees dying on those estates were imported from out of the State. All native trees observed on these estates, some of which are probably 75 to 100 years old, have so far remained unaffected. This suggested to Doctor Swingle that the disease is of long standing in this vicinity and that the old trees may be the result of natural selection and show some degree of resistance.

(W. D. Valleau, Kentucky Agricultural Experiment Station).

INCIDENCE OF EAR ROTS IN THE 1938 CORN CROP

Neil E. Stevens

The information on the incidence of corn ear rots in 1938 here summarized comes from 3 quite different sources: the results of licensed inspections at a number of terminal markets during June 1939, the reports of the corn performance tests for several States, and the results of the cooperative uniform comparisons of corn hybrids. All furnish objective measures of the percentage of diseased kernels present in samples of shelled corn, and thus serve to supplement the usual crop loss estimates.

Ear Rots in Corn at Terminal Markets

The results of licensed inspections of shelled corn received at various terminals during June 1939 were made available, as in previous years, through the courtesy of the Grain Division, Agricultural Marketing Service, U. S. Department of Agriculture. The method of assembling information was that used and explained in earlier reports (PDR 19: 71-93 and 20: 63-71, 316-320). These papers also give the reasons for considering total damage in June receipts a fairly reliable index of losses due to disease in the corn as it reaches terminal markets.

As in previous years, markets such as Chicago, Buffalo, and Pittsburgh, which regularly receive shipments from a wide area, are left out of consideration, as are also those which received less than 50 cars during June 1939. The map, Figure 1, gives the percentage of cars of shelled corn showing 5 percent or over total damage received during June 1939 at Toledo, Circleville, Ohio; Louisville, Kentucky; Indianapolis, Indiana; Peoria, Decatur, East St. Louis, Cairo, Illinois; Ceder Rapids, Clinton, Keokuk, Sioux City, Iowa; St. Joseph, Kansas City, Missouri; Topeka, Kansas City,

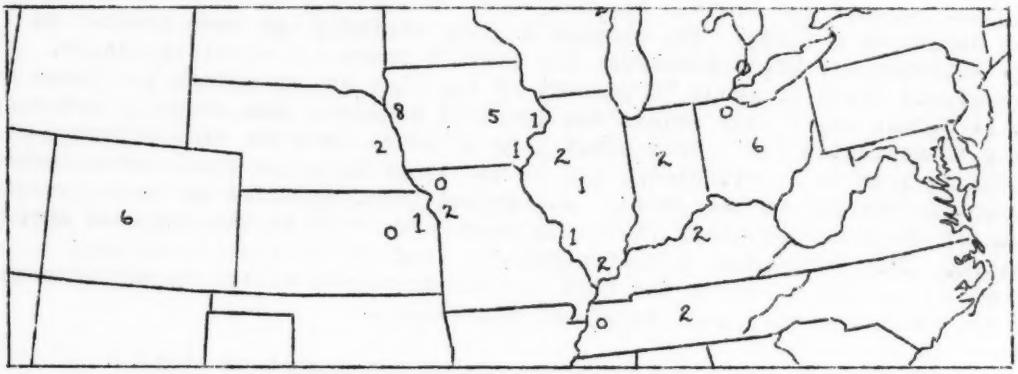

Fig. 1. June 1939 receipts -- 1938 crop. Percentage of cars of shelled corn showing 5 percent or over total damage.

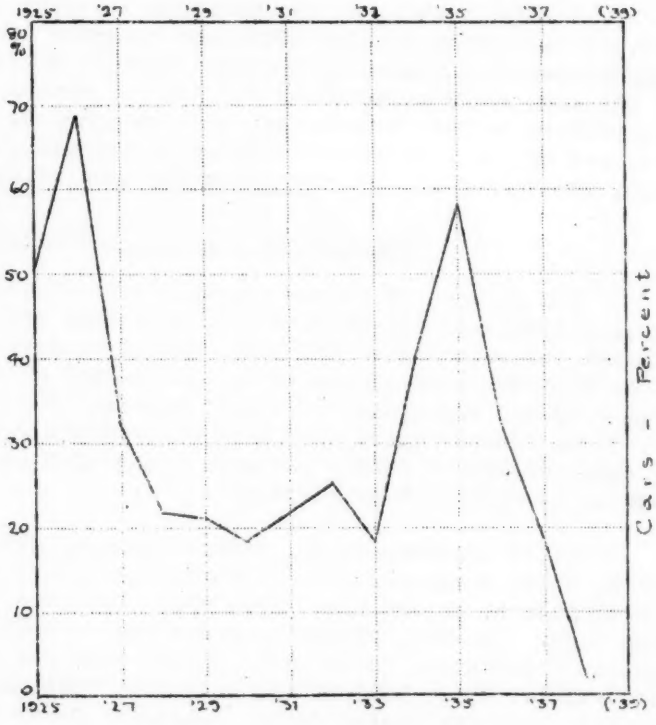

Fig. 2. Incidence of corn ear rots in the various crops as indicated by the percentage of cars of shelled corn showing 5 percent or over total damage in June of the following year.

Kansas; Omaha, Nebraska; Denver, Colorado; Memphis and Nashville, Tennessee. The average percentage of cars having 5 percent or more total damage for all the terminals listed in the test was only 2 (Fig. 2). If the large markets reporting, but not indicated on the map, are included, the average is still only 4.5 percent, very much less than any previous year for which we have these records. Comparison of the map for 1938 with those of earlier years shows that the difference was general; that is, there was no market in which a large portion of the cars showed a high percentage of damaged kernels. Apparently, at least that portion of the 1938 corn crop which reached terminal markets was unusually sound.

Data from the State Corn Performance Tests

For the last 4 years an additional measure of the incidence of ear rots has been furnished by the reports of the Corn Performance Tests in the various States (Fig. 3). As explained in an earlier summary (PDR 22: 129-133), beginning with the 1935 crop, those associated in the corn breeding program undertook to measure the losses from corn ear rots sustained by the various lines under test in terms of percentage damaged kernels in shelled samples. The figures given below were taken from the published reports of these tests for Indiana, Illinois, and Iowa. For Ohio, in which State alone the results were taken in percentage of damaged kernels by count, rather than by weight, the information was sent to the writer by Mr. G. H. Stringfield.

As already noted (PDR 22: 130), the plans of the corn performance tests differ somewhat in the several States. Accordingly, comparisons should be made of the amount of rot in the different years within each State, rather than between States. The tests were carried out in a number of localities in each State. The figures given are averages of the results of tests made in 29 localities in Ohio, 6 in Indiana, 10 in Illinois, and 12 in Iowa. The localities chosen were supposed to be representative of various corn producing sections and for each test strains supposedly adapted to the locality were selected. The number of strains is relatively large, often as many as 60. In Indiana and Illinois hybrid strains predominate, and in the figures for Ohio and Iowa only the hybrids were considered, although to have included open-pollinated strains would have made little difference in the results. The mean of all tests in each State show the following percentages of diseased kernels:

Ohio	0.76
Indiana	1.5
Illinois	1.2
Iowa	3.5

Data From the Cooperative Uniform Comparisons

The results for the 21 cooperative uniform comparisons of corn hybrids have been summarized in detail by M. T. Jenkins. Not all States reported data on damaged kernels. So far as the figures are given, however, they are included here for the sake of comparison. All of the determinations, except those in Ohio, were made in accordance with the classifications established by the Grain Standards Division, Agricultural Marketing Service, in determining Federal corn grades. The Ohio data report the percentage of damaged kernels by count in 500 kernels. The results, expressed as the mean of all the samples taken at each locality, are as follows:

	Damaged Kernels %
Early Top Crosses:	
Holgate, Ohio	0.6*
Wanath, Indiana	2.0
DeKalb, Illinois	1.2
Leland, Iowa	1.7
Midseason Top Crosses:	
Germantown, Ohio	0.4*
Lafayette, Indiana	1.2
Urbana, Illinois	2.0
Ames, Iowa	1.6
Manhattan, Kansas	1.4
Late Top Crosses:	
Manhattan, Kansas	1.1
Columbia, Missouri	1.7
Arlington, Virginia	4.2

All the figures derived from the State Corn Performance Tests, and from the Cooperative Uniform Comparisons, are low and give further indication that the corn crop of 1938 in these States was largely free from ear rots.

Publications From Which Portions of the Above Data Were Obtained

Results of the Cooperative Uniform Comparisons of Corn Hybrids. 1938. Mimeographed Report. Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture. Compiled by Merle T. Jenkins.

*by count

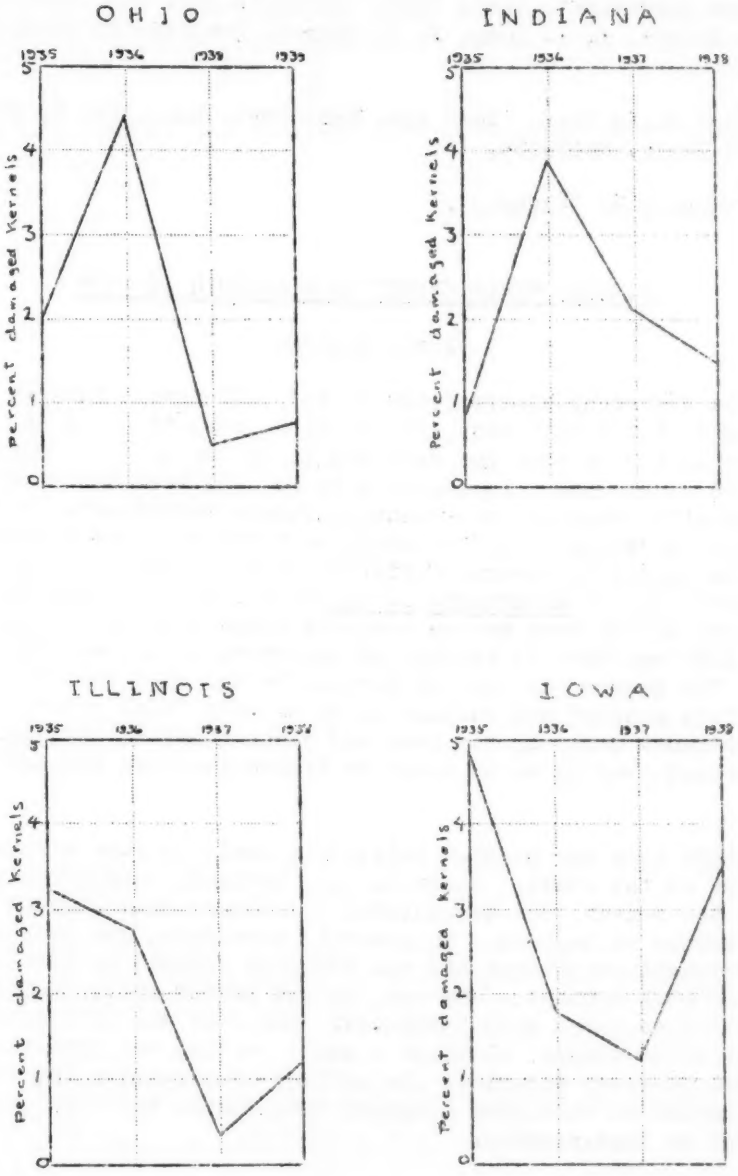

Fig. 3. Losses due to ear rots in the corn performance tests in various States, expressed as percentage of "damaged" kernels. See text for details.

1938 Indiana Corn Performance Tests. Mimeographed Report by S. R. Miles.

Illinois Corn Performance Tests 1938. Illinois Agr. Exp. Stat. Bul. 450, by G. H. Dungan, A. L. Long, J. H. Bigger, Benjamin Koehler, and Oren Bolin.

1938 Iowa Corn Yield Test. Iowa Agr. Exp. Stat. Bul. 379, by Marcus S. Zuber and Joe L. Robinson.

(University of Illinois).

TOBACCO FIELD SURVEY IN WISCONSIN IN 1939

James Johnson

Before reporting observations on the 1939 crop a further record should be made of the 1938 crop, the final outcome of which was not known until the present year when the crop was ready for market. During the 1938 curing period in Wisconsin incessant rain fell between September 5 and 19. The high humidity resulted in an unusual fungus development on the curing leaf, causing the forms of injury known as "stem-rot" and "pole-rot". The former may be caused by several different fungi but the latter is largely if not entirely due to Alternaria tenuis Nees. It is estimated that 85 percent of the entire crop was so severely damaged as to reduce its value very materially and that 25 percent of the above amount was rendered almost worthless. The damage was further favored by the fact that the crop was grown in a "wet season" and bundled in relatively "high case", thereby favoring continued decay by the same and other fungi in storage. The loss was the heaviest ever known to occur to Wisconsin-grown tobacco from such causes.

The 1939 crop was planted relatively early in June and made excellent progress at the start. Rainfall was, however, considerably below average for the season, the accumulated deficiency from January 1 to August 31 being 6 inches at Madison. In general, therefore, the crop was grown under semi-drought conditions and was somewhat reduced in size and perhaps in quality on this account. However, on the better soils in most locations exceptionally fine crops were harvested. The crop was also unusually free from hail or storm damage, although a small section was hail-cut in mid-season in the southern district. No serious or extensive insect damage occurred. Hornworms were more abundant than usual, but were generally kept under control by hand-picking.

Brown root-rot was found in serious proportions on only 10 or 12 fields. Although little tobacco is now grown after preceding crops harmful to tobacco, the injury from this source was nevertheless less common than in other years.

Black root-rot (Thielaviopsis basicola) caused reductions in growth of as much as 50 percent in a few fields but no extensive damage is attributable to the disease this year. The general use of root-rot resistant strains largely precluded heavy infection.

Blackfire (Bacterium angulatum) was practically absent both in the seed-beds and fields this year, despite an extremely heavy infection in 1938, which should have provided an abundant source of inoculum. The unfavorable weather conditions for infection in the seed-beds in particular probably accounts for the unusual freedom from this disease in the field as well. Weather conditions favorable to field infection were, however, also lacking.

Wildfire (Bacterium tabacum) was known to exist on 17 farms but no appreciable spread developed in the field. The seed-beds on 5 farms known to have wildfire in 1938 were sprayed weekly with Bordeaux mixture. No wildfire was found in any of these seed-beds or in the fields grown from these plants, whereas several other seed-beds in the vicinity developed mild cases of wildfire, which, however, yielded only slight field infection. It should be noted, therefore, that this spraying trial was not conducted under conditions of a heavy epidemic.

Mosaic (virus) was relatively low in incidence compared to past years, little infection having apparently resulted from overwintering in the soil. Three cases of heavy field infection observed clearly originated from seed-bed infection, the source of which was not determined.

Tobacco streak (virus), which is rarely of any economic consequence, was more common than in past years. One field was seen in Vernon County with about 75 percent of the plants at one end of field infected. Normally, only isolated plants show this disease.

Frenching was seen in only 2 fields. Potash starvation or other nutritional symptoms were comparatively rare.

In general, the crop was one of the soundest produced in the State for many years. The curing season up to September 20 was dry and hot, and no curing house damage comparable to that in the 1938 crop is anticipated.

EFFECT OF WIND ON BLOSSOM-END ROT OF TOMATOES

James G. Horsfall and A. D. McDonnell

It has long been suspected that wind aggravates blossom-end rot of tomatoes. A field near Stratford, Connecticut, examined August 5, 1939, offered data on the subject. The tomatoes were planted on the eastern side

of an extensive flat area of land, so that the prevailing west wind had a clean sweep at them. The rows ran north and south across the line of wind. The plants were trained on stakes about 5 feet high, so that the wind-break effect of the western rows would be more pronounced than if the plants had not been staked. The summer had been very dry, but some surface irrigation had been applied.

The field was sampled by taking contiguous 50-foot sections of each of the 7 most western rows. The affected fruits were all counted. The following data were obtained.

Row Number	Number of Fruits with Blossom-End Rot
1 (outside)	42
2	27
3	17
4	12
5	4
6	9
7	5

A curve plotted from these data is typically J-shaped as would be expected if the wind had aggravated the disease on the western rows. The fruits appeared to have all been affected the same day as diseased ones were all about the same size. The same situation was observed August 8 at Newington, although counts were not made.

Presumably the water outgo gradually increased toward the upper end of root capacity. A day of drying wind could then increase the water outgo beyond root capacity and bring on an attack of blossom-end rot. If irrigation water were then added or the wind had ceased, the demand would fall below the supply and later fruits might not be affected.

(Connecticut Agricultural Experiment Station).

VEGETABLE PATHOLOGY NOTES FROM SOUTH CAROLINA

C. F. Andrus

Beans: Web blight (Rhizoctonia microsclerotia) damaged a small acreage of Bountiful and Great Northern beans late in August. The loss promised to be complete but the termination of heavy summer rains in early September checked the disease abruptly. The web blight was accompanied by unusually distinct Alternaria leaf spots.

Tomatoes: The study of tomato defoliation diseases attained new complications in 1939 when a species of Stemphylium and one of Mycosphaerella were found to be predominant in leaf spots. In 1938 Macrosporium was predominant and in 1937 Septoria was said to be most prevalent in this area. No Septoria has been observed since 1937. A Diplodia stage has been found associated with some of the Mycosphaerella cultures. Other pycnidial types are also present.

Watermelons: Dr. M. N. Walker called the writer's attention to the fact that downy mildew (Peronoplasmopara cubensis)[Pseudoperonospora] was extremely prevalent on watermelons in this area. Anthracnose [Colletotrichum lagenarium] was prevalent as usual and caused considerable loss on fruit, but possibly the greater amount of defoliation was due to downy mildew.

(U. S. Southeastern Regional Vegetable Breeding Laboratory, Charleston, South Carolina).

BRIEF NOTES AND A CORRECTION

SCLEROTIUM DELPHINII ON TRILLIUM: Cynthia Westcott sent a trillium rootstock infected with Sclerotium delphinii, with the accompanying note, "This was one of a lot of several hundred sent from Exeter, New Hampshire, to a grower in Rydal, Pennsylvania. Although at the time of arrival (September 5, 1939) not many of the rootstocks were showing external signs of crown rot, about half of each one was spongy and when put in a moist chamber for a couple of days produced the characteristic mycelium and the initial forms of sclerotia. This may have been recorded on trillium before, but I have seen no reference to it." There is no other record of the fungus on trillium in the Survey files.

CEREBELLA ON CARPET GRASS: Two specimens of Cerebella andropogonis Ces. on Axonopus compressus have recently been received from southern States. D. C. Neal sent one, collected by a Soil Conservation worker at Alexandria, Louisiana. The other was received from L. E. Miles, who wrote, "The enclosed specimen of carpet grass was sent in to me by Mr. S. J. Randall of Woodville, Mississippi. He states that a considerable number of acres are affected in this manner in his county and that the disease is quite troublesome."

CORRECTION: L. R. Tehon writes that the note on "Reduction in wheat yield in Illinois in 1938 due to the orange leaf rust" in the preceding issue, pages 295 to 296, is a joint contribution with G. H. Boewe.